REMARKS

The objection to the Abstract has been addressed.

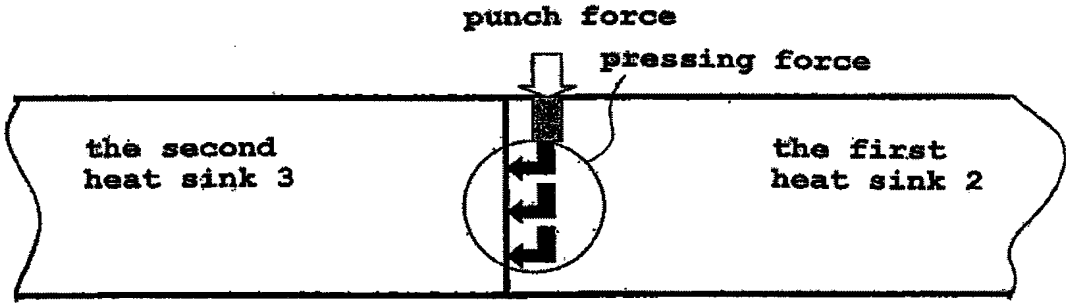
The rejection of Claims 1-8 and 10 as being unpatentable over JP '478 in view of JP '204 under 35 U.S.C. §103(a) is respectfully traversed. Reconsideration is requested in view of the foregoing amendments and following comments.

Applicants have already commented upon JP '204 document at pages 2 and 3 of their specification. Those comments which outline the problem with this prior art approach are incorporated herein as well as along with the following. According to JP '204, the mounted member 1 is joined to the radiator member in a melted condition. According to the paragraph [0015], the mounted member 1 is heated to 1300°C in gaseous nitrogen in the container 4 shown in Fig. 5, before being joined to the radiator member 2. The infiltration bonding described in this document has been described at page 2, second full paragraph of the specification.

In the present invention as shown in the sketch below, a semiconductor component is fixed on a surface of the second heat sink 3 by solder. The linear expansion coefficient of the second heat sink 3 is smaller than that of the first heat sink 2. The second heat sink 3 fixing the semiconductor component is supported in the hole 4 formed at the first heat sink 2 as described in the specification and shown in detail in Figs. 1-8.

Pressure is applied to a partial portion of a surface of the first heat sink 2 for the vicinity of the outer surface of the second heat sink 3. The outer peripheral surface of the second heat 3 is bonded for close adhesion to the plastic flow portion of the material of the first heat sink 2 in the aforementioned vicinity of the outer peripheral surface of the second heat sink 3.

The pressure is applied to the one surface of the first heat sink 2 to form the pressing mark 6 in order to closely adhere to the material of the first heat sink 2 to the outer peripheral surface of the second heat sink 3 by using the plastic flow, all as described at page 10 et. seq. of the specification. The material of the first heat sink 2 presses the outer peripheral surface of the second heat sink 3 strongly, and the pressure force of the material is maintained.



The expansion coefficient of the first heat sink 2 is larger than that of the second heat sink 3, so that the elongation percentage of the first heat sink 2 is larger than that of the second heat sink 3 when a punch force is applied to the first heat sink 2. The material of the first heat sink 2 therefore presses the outer peripheral surface of the second heat sink 3 strongly. The pressing force applied

to the second heat sink 3 is maintained when the punch force is no longer applied to the first heat sink 2. And pressing mark 6 remains on the first heat sink 2 after removing the punch force. The heat generated from the semiconductor components is transmitted to the first heat sink 2 through the second heat sink 3 efficiently so that the semiconductor components can be cooled down at a desired rate.

Turning to the JP '478 document, the entire surface of the second metal plate 16 shown in Fig. 1 is pressed for adhering to the first metal plate 14. The heat resistance between the first metal plate 14 and the second metal plate 16 is very large compared with the heat resistance between the first heat sink 2 and the second heat sink 3 according to the present invention. The pressing force of the second metal plate 16 in the JP '478 arrangement is small compared with the pressing force of the first heat sink 2 according to the present invention. Therefore, adequate cooling cannot be obtained because the entire surface of the second metal plate 16 is pressed in the JP '478 device.

Paragraph [0022] of JP '478 describes the expansion coefficient of the second metal pate 16 being nearly equal to that of the first metal plate 14. If the heat expansion coefficient of the first metal plate 14 were not equal or nearly equal to that of the second metal plate 16, the second metal plate 16 could be dropped out of the first metal plate 14. In the present invention, however, the expansion coefficient of the second heat sink 3 is smaller than that of the first

heat sink 2. JP '478 neither teaches nor suggests that the expansion coefficient of the first heat sink should be substantially different from that of the second heat sink.

In paragraph [0023] of the JP '478 document, the second metal plate 16 may unintentionally be dropped from the first metal plate 14 in the first embodiment as shown in Figs. 1 to 3. Because of that possibility, the second embodiment shown in Figs. 11, 14 and 16 prevents the second metal plate 16 from dropping from the first metal plate 14.

In Fig. 11, a first projecting portion 26 is formed on the first metal plate 14. The second projecting portion 30 is formed on the second metal plate 16. The methods for a second portion 30 are shown in Figs. 12 and 13, respectively.

According to the structures shown in Figs. 11, 14 and 16, the first portion and second portion 30 are formed on the metal plates 14 and 16 to prevent the dropping-out. As shown in Fig. 14, the first portion 26 is interposed between the second portion 30 and the caulking portion 34. The interposing direction of the overhang 30 and the caulking portion 34 is the vertical direction (the surface 16b to 16a), not the horizontal direction involving the peripheral surface of the first metal plate 14 to the peripheral surface of the second metal plate 16). Therefore, a sufficiently strong pressing force cannot be generated between the inner peripheral surface of the first metal plate 14 and the outer peripheral surface of the second metal plate 16. Further, as shown in Fig. 16 of the JP '478 document,

the second overhang 30 of the second metal plate 16 is interposed between the first overhang 26 and the caulking portion 34 of the first metal plate 14. Likewise, a sufficiently strong pressing force cannot be generated between the inner peripheral surface of the first metal plate 14 and the outer peripheral surface of the second metal plate 16 as a result.

The hypothetical combination of the JP '478 and JP '204 documents is seen to be based on purely hindsight reconstruction evidenced by the statement in the Office Action for making that combination. Even if it were otherwise, however, the resulting hypothetical combination would not, among other things, result in the recess-shaped pressing mark that serves to prevent solder overflow when molten solder is applied in joining a semiconductor device to the second heat sink. Therefore, a *prima facie* case of obviousness is not present here.

Accordingly, early and favorable action is earnestly solicited.

If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and

please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket # 056205.58073US).

Respectfully submitted,

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